PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Consumer Protection and Safety Division
Rail Transit Safety Section

Resolution ST-55
Date: June 27, 2002

R E S O L U T I O N

RESOLUTION ST-55. GRANTING APPROVAL OF A FINAL REPORT OF AN ON-SITE SAFETY AUDIT OF THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY PERFORMED BY THE RAIL TRANSIT SAFETY SECTION OF THE COMMISSION'S CONSUMER PROTECTION AND SAFETY DIVISION.

Summary

This resolution approves the Consumer Protection and Safety Division's[1] final audit report titled, "Triennial On-Site Safety Audit of the Santa Clara Valley Transportation Authority," dated May 16, 2002. Santa Clara Valley Transportation Authority is ordered to implement the recommendations contained in the report and to provide quarterly progress reports to the Consumer Protection and Safety Division.

Background

Commission General Order No. 164-B, "Rules and Regulations Governing State Safety Oversight of Rail Fixed Guideway Systems" and Federal Transit Administration (FTA) Final Rule 49 CFR, Part 659, "State Safety Oversight of Rail Fixed Guideway Systems" require the Commission, as the designated state safety oversight agency for California, to conduct on-site safety reviews of transit agencies operating rail fixed guideway systems at least once every three years. Following the completion of each review, the Commission is required to issue a report containing its findings and recommendations. This report must also contain a determination of whether or not the transit agency's system safety program plan should be updated.

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[1] On June 6, 2002, the Rail Safety and Carriers Division became part of the new Consumer Protection and Safety Division.

Audit Procedure

Staff of the Rail Transit Safety Section of the Commission's Consumer Protection and Safety Division conducted an on-site, safety audit of the Santa Clara Valley Transportation Authority (SCVTA) light rail transit system during the period from October 30 to November 5, 2001. The methods used to conduct the audit included:

- Discussions with SCVTA management
- Reviews of procedures and records
- Observations of operations and maintenance activities
- Interviews with rank and file employees
- Inspections and measurements of facilities and equipment

A full description of the audit, including the scope, results and recommendations, is contained in the final audit report, which is attached to this resolution as Attachment A.

Discussion

The results of the audit show that SCVTA is effectively implementing its System Safety Program. Exceptions, however, were noted during the audit. These are described, where applicable, in the Results / Comments Section of each checklist within the final report, along with recommendations to correct each identified exception. Ten checklists contain recommendations.

Following the audit, staffs of both the SCVTA and the Rail Transit Safety Section were able to achieve full agreement on the recommendations. SCVTA will perform the necessary follow up actions to assure that the recommendations in ten of the checklists are fully implemented. SCVTA will prepare a plan and schedule for each recommendation showing each step of the work to be done, when it will be done, and the person responsible for getting it done. The implementation plans and schedules for each recommendation will be provided to the staff of the Rail Transit Safety Section by August 1, 2002. In addition, beginning on September 1, 2002, SCVTA will provide the staff of the Rail Transit Safety Section with quarterly status reports until all recommendations are fully implemented. These quarterly status reports will include updates that show the work completed and the work remaining for each recommendation.

The Consumer Protection and Safety Division recommends that the Commission approve the Rail Transit Safety Section's final audit report titled, "Triennial On-Site Safety Audit of the Santa Clara Valley Transportation Authority," dated May 16, 2002. It is also recommended that the Commission order SCVTA to:

- Submit a report to the Rail Transit Safety Section containing plans and schedules for implementing the recommendations contained in ten of the checklists.

- Implement all recommendations in accordance with the plans and schedules submitted.

- On the first day of each quarter, provide the Rail Transit Safety Section with quarterly reports on the status of the recommendations until all recommendations are fully implemented.

Protests

All interested parties, including SCVTA, have been advised of the contents of this resolution, and no protests or objections have been received. Accordingly, pursuant to Public Utilities Code Section 311(g)(2), the otherwise applicable 30-day period for public review and comment is being waived.

Therefore, IT IS ORDERED that:

1. The Consumer Protection and Safety Division's request for approval of the Rail Transit Safety Section's final audit report titled, "Triennial On-Site Safety Audit of the Santa Clara Valley Transportation Authority," dated May 16, 2002, is granted.

2. Santa Clara Valley Transportation Authority (SCVTA) shall implement all recommendations contained in the report, in accordance with the plans and schedules submitted to the Rail Transit Safety Section staff.

3. SCVTA shall submit plans and schedules for implementing all recommendations contained in the final audit report to the staff of the Rail Transit Safety Section on August 1, 2002.

4. SCVTA shall prepare and submit quarterly status reports to the Rail Transit Safety Section. These reports shall contain detailed information on the implementation of all recommendations contained in the final audit report. Reports shall be due on

June 1, September 1, December 1, and March 1. The reports shall continue to be submitted until all recommendations are fully implemented.

5. This resolution is effective today.

I certify that this resolution was adopted by the Public Utilities Commission of the State at its regular meeting in California held on June 27, 2002. The following Commissioners voting favorably thereon:

WESLEY M. FRANKLIN
Executive Director

ATTACHMENT A

CPUC TRIENNIAL ON-SITE SAFETY AUDIT

OF

SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

TRIENNIAL ON-SITE SAFETY AUDIT

OF THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

AUDITORS: RAED DWAIRI, ERIK JUUL, DENNIS REED, ROBERT STRAUSS, GARY ROSENTHAL, JOEY BIGORNIA, BRIAN YU

RAIL TRANSIT SAFETY SECTION
CONSUMER PROTECTION AND SAFETY DIVISION
CALIFORNIA PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
SAN FRANCISCO, CA 94102

MAY 16, 2002

FINAL REPORT

PREPARED FOR:

SANTA CLARA VALLEY TRANSPORTATION AUTHORITY
3331 NORTH FIRST STREET
SAN JOSE, CA 95134

CALIFORNIA PUBLIC UTILITIES COMMISSION

TRIENNIAL ON-SITE SAFETY AUDIT OF THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY (SCVTA)

MAY 16, 2002

INTRODUCTION

The Rail Transit Safety Section of the California Public Utilities Commission's (Commission) Consumer Protection and Safety Division conducted the second triennial, on-site, safety audit of the Santa Clara Valley Transportation Authority (SCVTA) from October 30 to November 5, 2001.

The Commission's General Order (GO) No. 164-B and the Federal Transit Administration's (FTA) Final Rule, 49 CFR Part 659, require the Commission staff to perform triennial, on-site, safety audits of each transit agency operating a rail fixed guideway system in California. The purpose of these audits is to verify compliance with, and evaluate the effectiveness of, each rail transit agency's system safety program. System safety programs are reviewed by the Commission before being adopted and are the blueprint for transit agency safety activities.

The audit results show that SCVTA has the organizational structure and controls in place to operate its rail system safely. The 2001 audit verified that the 1998 audit recommendations were fully implemented. The audit also revealed a need for improvement in 10 of the 25 areas examined. Staff and SCVTA staff agreed on all the recommendations. Implementation of this audit's recommendations will enhance the safety and reliability of the rail system at SCVTA.

PROCEDURE

The audit was conducted in accordance with the Commission's procedure RTSS-4, Procedure for Performing Triennial Safety Audits of Rail Transit Systems. Staff developed the criteria, to evaluate the various departments with system safety responsibilities, using FTA and American Public Transit Association guidelines and the staff's knowledge of the transit system. Each set of criteria became a checklist and was used to document the audit.

Each checklist identifies the safety-related elements and characteristics that Staff audited the SCVTA reference documents that established the acceptance requirements, and the method that Staff used for evaluating compliance with the requirements. The methods used include:

- discussions with SCVTA management
- reviews of procedures and records
- observations of operations and maintenance activities
- interviews with rank and file employees
- inspections and measurements of equipment and infrastructure

The audit used 25 checklists. The checklists concentrated on requirements that affect the safety of train operations, and that are known or believed to be important to reducing safety hazards and preventing accidents (See Appendix A for a list of the checklists).

In designing the checklists for the 2001 audit, the corrective actions implemented as a result of the 1998 audit recommendations were a key consideration. The corrective actions taken in response to the 1998 audit recommendations either involved the completion and approval of procedures that were in draft form at the time of the 1998 audit, or the development and implementation of new programs that clearly identify certain departmental requirements. It was therefore important that the 2001 triennial safety audit reexamines these areas to gauge the effectiveness and proper implementation of these revised procedures and newly developed programs.

STATUS OF THE 1998 AUDIT RECOMMENDATIONS

The Rail Transit Safety Section of the Commission's Consumer Protection and Safety Division conducted the first triennial, on-site, safety audit of SCVTA from September 14 to September 25, 1998. This audit was conducted in accordance with the same procedures outlined above and resulted in Resolution ST-40. Resolution ST-40 ordered SCVTA to develop an appropriate corrective action plan and

implementation schedule to carry out 23 recommendations and to keep the Commission staff advised of SCVTA's progress through semi-annual reports.

SCVTA submitted the first semi-annual progress report in August 1999 and followed it with timely submissions in February and August of each following year until the recommendations were fully implemented in August, 2001. The individual reports included evidence showing the completion of corrective actions satisfying the recommendations. Completion of corrective actions was also verified in Year 2001 audit.

YEAR 2001 AUDIT FINDINGS

The majority of documents reviewed, activities observed, and items inspected complied with the requirements of SCVTA's System Safety Program. The audit revealed areas in need of improvement in 10 of the 25 checklists. The findings for each element / characteristic audited are summarized below, broken out by SCVTA department (See Appendix C for the complete checklists). Based upon the audit findings, recommendations for improvement to the SCVTA system safety program were presented to the SCVTA staff at the post audit exit meeting. Staff recommendations are included below and are separately attached as Appendix B.

Way, Power, & Signal (W, P, &S):

The Way, Power, & Signal Department is responsible for the maintenance of track, traction power, train protection, train control, wayside signaling, train stations, and right-of-way. Ten of the 25 checklists focused on the W, P, & S Department.

Findings – Conforming Conditions

1. No exceptions were found with the adjustment and functional check of inspected track switches.
2. No exceptions were found with the reflective striping on crossings gate arms.
3. No exceptions were found in the vertical clearance and insulation requirements of GO 95 when the Overhead Contact System (OCS) was inspected.
4. No exceptions were found when reviewing available OCS maintenance records.

5. No exceptions were found with the control & documentation of the Lock out & Tag Procedures.
6. No exceptions were found with the right-of-way maintenance and vegetation control procedures. All documentation pertaining to the vegetation control and fence repair program was satisfactory.
7. No exceptions were found when reviewing available Substation maintenance records.
8. No exceptions were found when reviewing the gated grade crossings preventive maintenance records, the vital relays preventive maintenance records, and passenger station preventive maintenance records. All required inspections were properly documented and noted defects were corrected in a timely manner.
9. No exceptions were noted in scheduling and executing the required internal audits by the W, P, & S Department.

Findings – Non-Conforming Conditions

10. Two of six inspected gated grade crossings had a lamp voltage on standby power less than 85 percent of the prescribed lamp rating. Maintaining voltage levels is important to ensure back-up batteries are properly charged and able to function during blackouts. Additionally, at half of the inspected crossings some flashing lights were not visible to an approaching highway user. Applicable preventive maintenance procedures do not currently incorporate voltage checks for the on-gate voltages.
11. There is no timetable that shows track speed on all segments of the system. This makes it difficult for train operators to adhere to speed limits and for Rail Supervisors to monitor their adherence when evaluating operators' performance.
12. Current OCS design and construction is in violation of Rule 74.4-F of GO 95. The nature of this violation is such that it makes it possible for live conductors to come within unsafe distances in the case of a failure of a single suspension.
13. The records for only three months were made available to the auditors when reviewing OCS inspection forms. GO 143-B, Section 14.06 requires inspection records to be kept on-file for four prior calendar years.

14. The records for only three months were made available to the auditors when reviewing substation inspection forms. GO 143-B, Section 14.06 requires inspection records to be kept on-file for four prior calendar years.
15. The internal audit program of W, P, & S does not currently monitor the implementation of the identified corrective actions. Monitoring of corrective actions mandated as a result of internal audits conducted by the W, P, & S Department ensures that preventive maintenance activities are carried out on schedule and in accordance with agency standards.

Recommendations

1. Determine the extent of the low voltage values and flashing lights misalignment at grade crossings throughout the system and rectify in a timely manner. Additionally, revise procedure MTN-PR-6205, Crossing Gate Preventive Maintenance issued 04/07/99, to incorporate annual checks for on-gate voltages. (Checklist No. 1)
2. Develop a timetable showing normal operating track speeds. (Checklist No.2)
3. Develop and implement a plan to correct the violations of GO 95, Rule 74.4-F, Overhead Trolley Contact Conductors. (Checklist No. 3)
4. SCVTA's Internal Audit Department, in consultation with the Commission's designated representative, should monitor the implementation of the OCS Inspection Procedure to ensure that **all** inspection frequencies identified in the procedure (i.e. Monthly, Semi-annual, Annual) are performed and properly documented. (Checklist No. 18)
5. SCVTA's Internal Audit Department, in consultation with the Commission's designated representative, should monitor the implementation of the Substation Inspection Procedure to ensure that **all** inspection frequencies identified in the procedure (i.e. Weekly, Quarterly, Semi-annual, Annual) are performed and properly documented. (Checklist No. 19)
6. The Internal Audit Program staff should expand the current procedure to identify which department should have the responsibility of monitoring the implementation of corrective actions identified during preventive maintenance audits. (Checklist No. 25)

Vehicle Maintenance:

The Vehicle Maintenance Department is responsible for the regular inspection and repair of the light rail vehicles (LRV's) at SCVTA. It utilizes a maintenance plan to ensure system safety and quality assurance.

Findings – Conforming Conditions

1. No exceptions were recorded when visual inspections were performed to check on the condition of safety appliances such as brake systems, coupling mechanisms, and truck/wheel components. All maintenance records reviewed indicated that all inspections were regularly performed and work orders closed out in a timely manner.
2. Vehicle maintenance employees were regularly trained on blood borne pathogens and on the safe handling and disposal of needles, blood, and other bodily fluids.
3. No exceptions were found when the maintenance records of three randomly selected LRV's were reviewed. All required inspections were performed regularly, documented properly, and noted defects closed out in a timely manner.

Findings – Non-Conforming Conditions

4. When reviewing LRV inspection standards, one exception was noted pertaining to the absence of inspection and repair requirements of wheel tread surface defects. Such requirements ensure that these defects are detected and repaired as part of the regularly scheduled maintenance program. This in turn ensures against possible derailments caused by poor wheel-track interface and has the added benefit of reducing wheel squeaking noise.
5. There is no written procedure for introducing vehicle modifications. A written procedure will remove any ambiguity as to the process of introducing vehicle

modifications and ensure that these modifications have been reviewed, approved, and documented.

Recommendations

1. Develop written standards to cover inspection and repair of wheel tread surface defects (including condemning limits). These standards shall be incorporated in the appropriate LRV preventive maintenance inspection checklists. (Checklist No. 4)

Risk Management:

The department is responsible for the internal safety audit program, accident investigations, and hazardous materials management at SCVTA.

Findings – Conforming Conditions

1. No exceptions were noted as a result of reviewing the agency's annual internal safety audit reports for the years 1999, 2000, & 2001. All the required elements were audited and satisfactorily completed.
2. No exceptions were recorded pertaining to consistency of the agency's applicable accident investigation plans and procedures. Interagency cooperation and coordination was found to be at a sufficient level to assure that all accident causes are correctly identified, schedules and corrective action plans are devised, tracked, and implemented. All departments involved in accident investigations understand their respective roles & responsibilities and been trained on the proper execution & fulfillment of their functions.
3. No exceptions were noted in performing and documenting safety certification activities.

Findings – Non-Conforming Conditions

4. SCVTA's accident investigations need improvement. SCVTA did not submit a final accident investigation report for the March 12, 2001 passenger evacuation

at the Basset Underpass as required. SCVTA also did not include sufficient documentation detail in the final report submitted as a result of the Blossom Hill accident of June 4, 2001. Complete accident investigations reduce the likelihood of similar accidents reoccurring.

5. An exception was found in the Configuration Management area that affects the Risk Management Department. There was an apparent gap between Risk and Records Management Departments regarding the Rail System Safety Review Board (RSSRB) agendas, minutes and attachments. This occurred because of the lack of a written procedure for identifying and archiving RSSRB data in cooperation with Records Management. A written procedure will establish the steps that need to be followed when introducing changes to the rail system.
6. The hazardous materials program did not include a confined space entry-training component to be utilized by W, P, & S personnel. The addition of such a component will make the already effective hazardous materials management program become more comprehensive and less dependent on the use of outside contractors.

Recommendations

1. Submit final reports, as required by Section 4.1 of SOP 530 (LRA-PR-0530), Light Rail Accident Investigation/Reporting Procedure, and Paragraph 6.3 c, d, & e of General Order 164-B for all accidents that meet the immediately reportable criteria. GO 164-B requires that the final reports should include sufficient documentation detail for each item investigated to support the investigation findings, the most probable cause, underlying contributing causes, and recommendations. (Checklist No. 6)
2. Develop and implement a training procedure for confined space entry. (Checklist No. 12)

Records Management:

The department maintains all construction-related documents, document control, and reproduction at SCVTA.

Findings – Non-Conforming Conditions

1. Records Management lacks configuration management procedures for modifications introduced to rail design, vehicle maintenance, and maintenance engineering. Such procedures are needed to ensure that changes to the rail system are reviewed, approved, and documented.

Recommendations

1. Develop, finalize, and implement written configuration management procedures for record drawings in Rail Design and Construction, for Vehicle Maintenance modifications, and for Maintenance Engineering modifications. These procedures should be developed, finalized, and implemented in consultation with the Records Management staff. Additionally, develop and implement a written procedure for identifying and archiving RSSRB minutes, agenda items, and attachments in consultation with the Records Management staff.
   (Checklist No. 8)

Human Resources:

This department is responsible for employee safety screening and administering the Drug & Alcohol policies at SCVTA.

Findings – Conforming Conditions

1. No exceptions were found in the implementation of the Drug and Alcohol policies at SCVTA.

Protective Services:

The department is responsible for the security of the light rail agency. It gathers and reviews transit crime reports and identifies security breach causes to recommend additions or changes to policies & procedures.

Findings – Conforming Conditions

1. No exceptions were found in the implementation of the security portion on the agency's System Safety Program Plan (SSPP). This portion was found to be up to date.

Rail Operations:

This department oversees all aspects of safely operating current light rail system, supports operational training of rail employees, and ensures compliance with all operations procedures.

Findings – Conforming Conditions

1. No exceptions were found in the emergency response program. All required excursuses, drills, and training were satisfactorily performed.
2. No exceptions were found in executing restricted area access control procedures. The process employed to review, approve, issue, distribute, and file the restricted area access permits was found to be particularly well organized and exceeds the requirements of existing procedures.
3. No exceptions were noted in the review of rail operations rules and procedures. All applicable rules and procedures were reviewed and approved by the Rules and Procedures Development (RPD) and the Rail System Safety Review Board Committees.
4. No exceptions were noted in the retraining and re-certification program of rail employees. Further on-board field observations showed that operators complied with all applicable safety rules and procedures.
5. No exceptions were noted in the distribution, maintenance, and investigation of Unusual Occurrence Reports.

Quality Assurance:

The Quality Assurance department ensures that system components are per the safety standards and within allowable tolerances to safely operate the light rail system.

Findings – Conforming Conditions

1. No exceptions were recorded against the Calibration Program. Calibration certificates and records showed all components were calibrated per the required frequencies and corrective actions implemented in a timely manner.

COMMENTS AND ANALYSIS

On December 27, 2001, Staff provided a copy of the draft report including the checklists to SCVTA staff. Full agreement has been reached between Commission and SCVTA staff on all the above recommendations.

RECOMMENDATIONS

The Commission should adopt the staff report and require SCVTA to implement the recommendations contained in this report. For each recommendation, SCVTA should prepare and implement a corrective action plan and a schedule that identifies each step of the work to be done, when each step will be done, and the person responsible for getting it done. This planning and scheduling information shall be provided to the Commission staff for review and acceptance by August 1, 2002.

Beginning on September 1, 2002 SCVTA should provide the Commission staff with quarterly status reports until all work implementing the recommendations is completed. The status reports should include plan and schedule updates that show the work completed since the last report, work remaining for each recommendation, and any changes in schedule with the reason for the change.

Appendix A

CPUC TRIENNIAL SAFETY AUDIT
OF
SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

INDEX OF CHECKLISTS

13	Restricted Area Access Control		

Appendix B

CPUC TRIENNIAL SAFETY AUDIT
OF
SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

2001 Recommendations

Checklist 1 – Grade Crossing Warning Devices

1. Determine the extent of low voltage values at grade crossings throughout the system and rectify this situation in a timely manner.

2. Determine the extent of flashing lights misalignment at grade crossings throughout the system and rectify this situation in a timely manner.

3. Revise MTN-PR-6205-Crossing Gate Preventive Maintenance Procedure, Issued 04/07/99 to incorporate annual voltage checks for the on-gate voltages.

Checklist 2 – Track Inspection

4. Develop a timetable showing normal operating track speeds.

Checklist 3 – Traction Power Inspection

5. Develop and implement a plan to correct the violations of GO 95, Rule 74.4-F, Overhead Trolley Contact Conductors.

Checklist 4 – Light Rail Vehicle Inspection

6. Develop written standards to cover the inspection and repair of wheel tread surface defects (including condemning limits) and incorporate these standards in the appropriate LRV preventive maintenance inspection checklists.

Checklist 6 – Accident/Incident Reporting and Investigation

7. Submit final reports, as required by Section 4.1 of SOP 530 (LRA-PR-0530), Light Rail Accident Investigation/Reporting Procedure, and Paragraph 6.3 c, d, & e of General Order 164-B for all accidents that meet the immediately reportable criteria of GO 164-B. This requires that the final reports should include sufficient documentation detail for each item investigated to support the investigation findings, the most probable cause, underlying contributing causes, and recommendations.

Checklist 8 – Configuration Management

8. Develop, finalize, and implement written configuration management procedures for record drawings in Rail Design and Construction, for Vehicle Maintenance modifications, and for Maintenance Engineering modifications. These procedures should be developed, finalized, and implemented in consultation with Records Management.

9. Develop and implement a written procedure for identifying and archiving RSSRB minutes, agenda items, and attachments in consultation with Records Management.

Checklist 12 - Hazardous Materials Programs/Environmental Management

10. Develop and implement a training procedure for confined space entry.

Checklist 18 – Overhead Contact System

11. SCVTA's Internal Audit Department, in consultation with the Commission's designated representative, should monitor the implementation of the OCS Inspection Procedure to ensure that **all** inspection frequencies identified in the procedure (i.e. Monthly, Semi-annual, Annual) are performed and properly documented.

Checklist 19 – Substation Inspection

12. SCVTA's Internal Audit Department, in consultation with the Commission's designated representative, should monitor the implementation of the Substation Inspection Procedure to ensure that **all** inspection frequencies identified in the procedure (i.e. Weekly, Quarterly, Semi-annual, Annual) are performed and properly documented.

Checklist 25 – Way, Power, and Signal Internal Audit Program

13. The Internal Audit Program staff should expand the current procedure to identify which department should have the responsibility of monitoring the implementation of corrective actions identified during preventive maintenance audits. See Checklist Nos. 18 & 19.

Appendix C

CPUC TRIENNIAL SAFETY AUDIT
OF
SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

Audit Checklists

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

Checklist No.	**1**	**Persons Contacted**
Date of Audit	9/ 24 /01	Curtis Nicks – Superintendent, Way Power & Signal George Ramos – Signal Supervisor Tom Ryan – Signal Maintainer Rob Beldon – Signal Maintainer
Auditors	Bill Mealor Raed Dwairi Kevin Boles **Mahendra Patel**	
Department	**Way, Power & signal**	

REFERENCE CRITERIA

1. Light Rail System Safety Program Plan, November 2000, Element #24 – Grade Crossing Safety, Element 25-Joint Freight Operations,
2. Code of Federal Regulations CFR 49, Part 234-Grade Crossing Signal System Safety
3. MTN-PR-6205-Crossing Gate Preventive Maintenance, Issued 04/07/99

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

GATED GRADE CROSSINGS WARNING DEVICES – CPUC INSPECTOR

Utilizing the expertise of a FRA certified signal inspector from the Commission's Railroad Safety Branch, select a sample of gated crossings and perform detailed inspections to determine whether or not the selected crossings are in compliance with the applicable criteria.

RESULTS/COMMENTS

CPUC employee, Bill Mealor (FRA certified signal inspector) inspected gated grade crossings at the following intersections:

- Mathilda & Java
- Lockheed Martin & Mathilda (at Fire Station #5)
- Ellis Street at US 101 Northbound off-ramp
- Whiseman Rd. – East of Station
- Whiseman Rd. – West of Station
- Central Expressway

The scope of the inspections included checking the alignment of the warning lights, checking reflective striping on gate arms, and checking the voltage levels of the warning lights both in normal mode (AC power) and in standby mode (DC battery power).

The following exceptions were noted:

Mathilda Avenue & Java Rd.

- Lamp voltage on standby power less than 85 percent of the prescribed lamp rating

Lockheed Martin & Mathilda Avenue (at Fire Station #5)

- Lamp voltage on standby power less than 85 percent of the prescribed lamp rating
- Flashing light not visible to approaching highway user.

Whiseman Rd. – East of Station

Flashing light not visible to approaching highway user

Whiseman Rd. – West of Station

Flashing light not visible to approaching highway user

Recommendations:

14. Determine the extent of low voltage values at grade crossings throughout the system and rectify this situation in a timely manner.

15. Determine the extent of flashing lights misalignment at grade crossings throughout the system and rectify this situation in a timely manner.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

Checklist No.	**2**	**Persons Contacted**
Date of Audit	9/18/01	Curtis Nicks – Superintendent, Way Power & Signal George Ramos – Supervisor, Signal Kyle Olson – Supervisor, Track Tom Ryan – Signal Maintainer Rob Beldon – Signal Maintainer Jose Hernandez – Senior Track Worker
Auditors	Kevin McQuitty **Bill Mealor** **Raed Dwairi**	
Department	**Way, Power & Signal**	

REFERENCE CRITERIA

1. Code of Federal Regulations CFR 49, Part 213-Track Safety Standards
2. GO 143-B, Section 14.04-Track Maintenance Practices
3. MTN-PR-6415-Inspection & Maintenance of Turnouts & Diamond Crossings, Issued 09/15/00
4. MTN-PR-6416-Inspection & Maintenance of Rail Crossings, Issued 09/15/00
5. MTN-PR-6405-Track Geometry Standards, Issued 09/15/00

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

TRACK INSPECTION – CPUC INSPECTORS

Randomly select at least two road crossing and two turnout/diamond crossing areas from the track system. Utilizing the expertise of a FRA certified track inspector from the Commission's Railroad Safety Branch, perform detailed visual & dimensional inspections/measurements to determine whether or not all track components within the areas selected are in compliance with the applicable track maintenance standards. Additionally, utilizing the expertise of a FRA certified signal inspector from the Commission's Railroad Safety Branch, perform an adjustment and functional check of at least one switch machine for each of the turnouts selected.

RESULTS/COMMENTS

CPUC employees, Kevin McQuitty (FRA certified track inspector) and Bill Mealor (FRA certified signal inspector) inspected four yard switches, an interlocking at the Baypoint Station, and one curve just west of the aforementioned station.

Track Inspections included the following:

- Inspecting the roadbed for both drainage and vegetation,
- Inspecting the track geometry (gauge, surface, and alignment),
- Inspecting track structure (switches, turnouts, and frog components),

Signal Inspections were satisfactory which included the following:

- An adjustment and functional check of the switches associated with the turnouts selected,
- Observations of the way circuit controllers are configured on the switches in the areas inspected.

Track inspections were satisfactory with the following exceptions:

- No timetable showing track speeds was available. Operators currently rely on speed signs posted along the right-of-way only. Should a sign be missing or misplaced, operators would not necessarily know safe track speed.

Recommendations:

1. Develop a timetable showing normal operating track speeds.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY		
Checklist No.	**3**	**Persons Contacted**
Date of Audit	9/ 13 /01	Curtis Nicks – Superintendent, Way Power & Signal Billy Roberts – Supervisor, Power
Auditors	Dennis Lee **Raed Dwairi**	
Department	**Way, Power & Signal**	
REFERENCE CRITERIA		

1. CPUC General Order 95-Rules for Overhead Electric Line Construction
2. GO 143-B, Section 10-Traction Power Requirements, Section 14.06-Traction Power System Inspections
3. MTN-PR-6150-OCS Maintenance, Issued 04/30/01

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

TRACTION POWER INSPECTION – CPUC INSPECTOR(S)

Engineer(s) from the Commission's Utility Safety Branch will randomly select and inspect sections of the Overhead Contact System (OCS) to determine whether or not the sections selected are in compliance with Commission's General Order (GO) 95 requirements and applicable VTA standards.

RESULTS/COMMENTS

CPUC employee, Dennis Lee (Utilities Engineer of the Utility Safety Branch) inspected several sections of the Overhead Contact System (OCS) and found these sections to be in compliance with the clearance and insulation requirements of Commission's General Order (GO) 95. The sections inspected are:

- Hobson & North 1st Street Crossover
- Sonora & North 1st Street Intersection
- Substations #4 (pole 1.43B)
- Civic Center, Baypoint, Vienna, and Tasman Stations

An exception was noted at the Sonora & North 1st Street Intersection, Baypoint, Vienna, and Tasman Stations. Rule 74.4-F of CPUC General Order (GO) 95, Rules for Overhead Electric Line Construction states:

"All overhead trolley contact conductors shall be so supported and arranged that the breaking of a single "suspension" or fastening will not allow the trolley conductor, or live span wire, or current carrying connections to come within 10 feet from the ground or from any platform accessible to the general public".

It was found during the inspection that the Santa Clara Valley Transportation Authority (SCVTA) employs dynamic weight tensioning in its design and construction of the OCS. The tensioning weights are connected to the messenger and contact conductor by a single shackle and a single fiberglass rod insulator. Failure of a single component of a connection of this kind will allow both the messenger and contact conductor to fall to the ground. This is a violation of Rule 74.4-F.

Other light rail systems in the State have experienced failures of the fiberglass rod insulators and live conductors have fallen to the ground or onto trains because of this violation. This is a hazardous design and a serious violation of GO 95, Rule 74.4-F.

Recommendation:

1. Develop and implement a plan to correct the violations of GO 95, Rule 74.4-F, Overhead Trolley Contact Conductors.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY		
Checklist No.	**4**	**Persons Contacted**
Date of Audit	9/ 12 /01	Tom Kennedy – Superintendent, Vehicle Maintenance Mike Simoneau – Foreman, Quality Assurance
Auditors	Don Miller **Raed Dwairi**	

Department	**Vehicle Maintenance**	

REFERENCE CRITERIA

1. CPUC GO 143-B Section 14.04-Light Rail Vehicle Maintenance Practices
2. MTN-PR-5150-Light Rail Vehicle Daily Inspection Procedures, Issued 11/01/98
3. MTN-PR-5158-Light Rail Vehicle Maintenance Work Orders, Issued 07/01/98

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

LIGHT RAIL VEHICLE INSPECTION – CPUC INSPECTOR

Utilizing the expertise of a FRA certified inspector from the Commission's Railroad Safety Branch, a random selection and inspection of light rail vehicles will be performed to determine whether or not the vehicles selected are in compliance with the applicable maintenance standards of VTA.

RESULTS/COMMENTS

CPUC employee, Don Miller (FRA certified inspector) inspected Light rail Vehicle (LRV) numbers 844, 819, and 818 at the LRV Maintenance Facilities, Guadeloupe Division.

The scope of inspections included:

- Visual checks of the passenger cab/safety appliances, operator cab/appurtenance, truck/wheel components, traction motors, brake systems, pantographs, and coupling mechanisms,
- Reviews of maintenance records including Operator, Minor Inspection, Work Orders, and Quality Control Audit reports,
- Interviews with and observations of workmen during preventive maintenance inspections/repairs of LRV's in the shop,
- Comparisons of completed Work Orders against actual repairs on LRV's, and
- Review of the maintenance standards used to perform LRV maintenance inspections.

The inspected vehicles were in compliance with one exception, on **LRV #818**.

- A Minor Inspection was in-progress on this LRV during the audit. Based on a conversation with the workman assigned to this inspection, CPUC Inspector determined that the work being performed on this LRV was based on the standards developed for the Minor Inspection Checklists. A review of these standards revealed that wheel tread surface detects such as flat and shelled spots are not covered by the standard and subsequently left up to the discretion of the individual mechanic who is assigned the task of performing the aforementioned inspections.

Recommendation:

1. Develop written standards to cover the inspection and repair of wheel tread surface defects (including condemning limits) and incorporate these standards in the appropriate LRV preventive maintenance inspection checklists.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY		
Checklist No.	**5**	**Persons Contacted**
Date of Audit	November 5, 2001	Nanci Eksterowicz, Risk Manager
Auditors	Erik Juul Dennis Reed	

Department	**RISK MANAGEMENT**	

REFERENCE CRITERIA

1. Light Rail System Safety Program Plan, November 2000, Element #9 - Internal Safety Audit Process, Page 22
2. CPUC General Order 164-B, Section 4 – Internal Safety Audit Requirements, Effective 12/2/99
3. Procedures Manual for State Safety Oversight of Rail Fixed Guideway Systems, RTSS-5, Procedures for Safety Oversight of Transit Agency Internal Audit Programs
4. Code of Federal Regulations, CFR 49 Part 659
5. APTA Rail Safety Audit Program, Section 9 - Internal Safety Audit

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

INTERNAL AUDIT PROGRAM

Review the agency's Annual Internal Safety Audit Reports for the years 1999, 2000, and the work-in-progress for the year 2001 to determine whether or not the agency's Internal Safety Audit Program complies with the requirements of the reference criteria. Conduct interviews as appropriate to deduce weaknesses and/or strengths.

RESULTS/COMMENTS

The Auditors interviewed the Contacts regarding the Internal Audit Program. The Contacts provided a copy of a new procedure for the Internal Safety Audit Program. The purpose of this procedure is to provide a systematic method for documenting the effectiveness of management implementation of safety policies contained in the Rail System Safety Program Plan (SSPP) and to ensure compliance with Commission General Order 164-B. The Auditors reviewed the Annual Internal Safety Audit Reports and supporting documentation for the years 1999, 2000, and 2001. The audits for 1999 were conducted to the criteria of the previous SSPP. The audits for 2000 and 2001 were conducted to the criteria of the current SSPP. The Contacts reported that audits for all of the APTA elements were conducted during 2000 and 2001.
All of the APTA elements were audited and satisfactorily completed as follows:

Audit Year	APTA Element
2001	Hazard Identification/Resolution Process
2001	Accident/Incident Reporting & Investigation
2001	Internal Safety Audit Process
2000	Facilities Inspections (includes Systems Equipment & Rolling Stock)
2001	Maintenance Audits/Inspections (all systems and facilities)
2000	Rules/Procedures Review
2000	Training and Certification Review/Audit
2000 & 2001	Emergency Response Planning, Coordination, Training
2001	System Modification Review/Approval Process
2000	Safety Data Acquisition/Analysis
2000 & 2001	Inter-departmental/Interagency Coordination
2000	Configuration Management
2001	Employee Safety Program
2001	Hazardous Materials Programs
2001	Drug and Alcohol Abuse Programs
2000	Contractor Safety Coordination
2001	Procurement
2001	Security
2001	Grade Crossing Safety (Extra – Not an APTA Element)

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE

SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

Checklist No.	**6**	**Persons Contacted**
Date of Audit	November 5, 2001 (At VTA) November 15, 2001 (Teleconference)	RISK MANAGEMENT Nanci Eksterowicz, Risk Manager Bill Evans, Transit Safety Representative Jim Middleton, Rail Safety Supervisor TRANSPORTATION Chester Patton, Transportation Superintendent Mark Bugna, Assistant Superintendent, Field Operations John Carlson, Assistant Superintendent, Transportation Communications MAINTENANCE ENGINEERING Kris Sabherwal, Rail Systems Engineer Hussein Fouad, Senior Systems Engineer
Auditors	Erik Juul Dennis Reed	
Departments	**RISK MANAGEMENT** **TRANSPORTATION** **MAINTENANCE ENGINEERING**	

REFERENCE CRITERIA

1. Light Rail System Safety Program Plan, November 2000, Element #8 – Accident/Incident Reporting & Investigation, Element # 17 - Interdepartmental/Interagency Coordination
2. SOP 530 (LRA-PR-0530), Light Rail Accident Investigation/Reporting Procedure, Effective 5/10/01
3. SCVTA Light Rail Operations LRV Accident Investigation Procedures Manual, Revised January 1, 1995
4. MSP 5101, Impounding Light Rail Vehicles, Effective 5/1/1
5. Light Rail Operations, LRV Accident Investigation Procedures Manual Revised January 1, 1995
6. CPUC General Order 164-B, Sections 5 & 6, Effective 12/2/99
7. Code of Federal Regulations, CFR 49 Parts 659.41 Investigations & 659.43 Corrective Actions
8. APTA Rail Safety Audit Program, Section 8 – Accident/Incident Reporting & Investigation
9. SOP #9.14 Accident Investigation Procedures, dated 1/1/95

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

ACCIDENT/INCIDENT REPORTING & INVESTIGATION

Through a review of the agency's reports prepared following accidents that met the immediately reportable criteria of GO 164-B in the year 2001, and interviews with as needed key personnel from the departments that are directly involved in accident reporting & investigation, determine whether or not:

1. Agency's policies, plans, and procedures that deal with the subject matter are consistent.
2. Interagency cooperation and coordination is at a sufficient level to assure that all causes are correctly identified, schedules & corrective action plans are devised, tracked, and implemented.
3. All departments involved understand their respective roles & responsibilities.
4. All departments involved have been trained on the proper execution & fulfillment of their accident investigation functions.

RESULTS/COMMENTS

Three VTA departments are directly involved in accident reporting & investigation: Risk Management, Transportation, and Maintenance Engineering. All three departments work together in the implementation of SOP 530 (LRA-PR-0530), Light Rail Accident Investigation/Reporting Procedure, Effective 5/10/01.

The Auditors interviewed VTA staff in Risk Management. Risk Management responsibilities include the overall responsibility and management authority for conducting and documenting all CPUC-reportable investigations and unacceptable hazardous condition occurrences, convening the Serious Accident Committee to review occurrences and make recommendations, and submitting final accident investigation reports to the CPUC.

Risk Management staff identified three accidents that met the immediately reportable criteria of GO 164-B in the year 2001:

- March 12, 2001 – Passenger Evacuation at Bassett Underpass
- June 4, 2001 – Fatality at Blossom Hill Grade Crossing
- June 4, 2001 – Fatality at Curtner Station

The Auditors reviewed the records of these three reportable incidents.

The Auditors interviewed VTA staff in Transportation. Transportation responsibilities include notifying CPUC, investigating the accident, documenting physical evidence at the scene, and preparing occurrence reports.

The Auditors interviewed VTA staff in Maintenance Engineering. Maintenance Engineering responsibilities include documenting and listing accidents by type, preparing and submitting monthly accident reports to CPUC, and maintaining a comparative accident database for analysis and trend tracking.

1. The Auditors found that VTA's policies, plans, and procedures that deal with accident reporting & investigation are consistent.
2. The Auditors found that, in general, interagency cooperation and coordination is at a sufficient level to assure that all causes are correctly identified, schedules & corrective action plans are devised, tracked, and implemented. However, the Auditors found that only the draft report was submitted to the CPUC for the March 12, 2001 passenger evacuation at Bassett Underpass. The final report for this incident was not submitted to the CPUC, as required by Section 4.1 of SOP 530 and G.O. 164-B. In addition, the Auditors found that the final accident investigation report for the June 4, 2001 fatality at Blossom Hill grade crossing did not include sufficient documentation detail for each item investigated to support the investigation findings, the most probable cause, underlying contributing causes, and recommendations. The final accident investigation report for the June 4, 2001 fatality at Curtner Station was acceptable.
3. The Auditors found that all departments involved understand their respective roles & responsibilities.
4. The Auditors found that all departments involved have been trained on the proper execution & fulfillment of their accident investigation functions.

<u>Finding</u>:

1. The final accident investigation report was not submitted to the CPUC for the March 12, 2001 passenger evacuation at Bassett Underpass as required by Section 4.1 of SOP 530 (LRA-PR-0530) and G. O. 164-B. In addition, the final accident investigation report for the June 4, 2001 fatality at Blossom Hill grade crossing did not include sufficient documentation detail for each item investigated to support the investigation findings, the most probable cause, underlying

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

Checklist No.	**7**	**Persons Contacted**
Date of Audit	October 30, 2001	Len Eaton – Manager, Construction Inspection, Rail Design and Construction Division Linda Meadow – Manager, Safety Certification
Auditors	Erik Juul Dennis Reed Robert Strauss	
Department	Rail Design and Construction Division	

REFERENCE CRITERIA

1. Light Rail System Safety Program Plan, November 2000, Element #22 – Construction Contractor Operations, Element 23-Procurement, Element 15 – System Modification/Approval Process, Element 7-Hazard Identification/Resolution Process, Element 14-Emergency Response, Element 13-Training, Element 18-Configuration Mgmt/Control
2. VTA Light Rail Safety Certification Plan dated September 2000

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

SAFETY CERTIFICATION

For the recently completed Phase I (Zanker to I-880) of the Tasman East Project determine through review of relevant documentation whether or not the safety certification activities were performed and documented as required by the reference criteria.

RESULTS/COMMENTS

The Manager and Consultant gave the Auditors a presentation of the relevant documentation and the safety certification activities that were performed for the recently completed Phase I (Zanker to I-880) of the Tasman East Project.

The Auditors reviewed the following documentation:

VTA Light Rail Safety Certification Plan

VTA Safety Criteria 2000

Zanker to I-880 Light Rail Line Safety Certification Verification Report.

Safety Certification for Light Rail Training Program

Safety Certification Design/Construction Completion Certificates

The Auditors found that the safety certification activities were performed and documented as required by the reference criteria.

No deficiencies found.

Recommendation:

None.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

Checklist No.	**8**	**Persons Contacted**
Date of Audit	October 30 & 31, 01 November 2, 01	RECORDS MANAGEMENT
Auditors	Erik Juul Dennis Reed	Tim Ellenberger, Records and Reproduction Manager

Departments	**RECORDS MANAGEMENT** **RAIL DESIGN AND CONSTRUCTION** **VEHICLE MAINTENANCE** **MAINTENANCE ENGINEERING** **RISK MANAGEMENT**	

REFERENCE CRITERIA

1. No procedures were available at the time this checklist was written.
2. Light Rail System Safety Program Plan, November 2000, Element #18 – Configuration Management

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

CONFIGURATION MANAGEMENT

Track a sample of changes to the rail system to determine whether or not the RSSRB reviewed and approved the changes, Rail Projects Design drawings incorporated and distributed the changes to the appropriate departments.

RESULTS/COMMENTS

The VTA departments directly involved in configuration management include Records Management, Rail Design and Construction, Vehicle Maintenance, Maintenance Engineering, and Risk Management.

The Auditors interviewed the Records and Reproduction Manager and the Document Control Clerk – Lead in Records Management. Records Management maintains all construction-related documents in a master file. Every document is indexed up to 13 fields and provides a record that can be searched. Since the 1998 triennial audit, the Records Management functions have been expanded to oversee the documentation of the field offices and archive that information in the main office. Records Management staff is proactive in gathering documents from the various VTA departments. Written Configuration Management procedures for each VTA department should be prepared in consultation with Records Management staff.

The Auditors interviewed the Manager – Construction Inspection in Rail Design and Construction. The Manager reported that he has a non-written process in place for completing record drawings for the configuration management program. He has drafted a written procedure for completing record drawings for the configuration management program. He agreed that the written procedure should be finalized and implemented.

The Auditors interviewed the Maintenance Superintendent in Vehicle Maintenance. There is no written procedure for Vehicle Maintenance modifications. However, the Superintendent reports that he has a non-written process in place for Vehicle Maintenance modifications. He agreed that a written procedure should be developed and implemented.

The Auditors interviewed VTA staff in Way, Maintenance Engineering. They reported that they have a non-written process in place for Maintenance Engineering modifications. They have drafted a written procedure for Maintenance Engineering modifications. They agreed that the written procedure should be finalized and implemented.

The Auditors interviewed VTA staff in Risk Management. They reported that Risk Management has recently begun to send the Rail System Safety Review Board (RSSRB) minutes, agenda items and attachments to Records Management to archive in an electronic file. There is an apparent communications gap from Risk Management to Records Management regarding the RSSRB agendas, minutes and attachments. Records Management has identified only one System Modification change for the past three years, when in fact there have been many changes. Many changes are last minute items on the RSSRB agenda, and are not being captured. RSSRB has directed Risk Management to establish guidelines for submitting RSSRB documents to Records Management on a regular basis. A written procedure should be developed and implemented for identifying and archiving RSSRB minutes, agenda items, and attachments with Records Management.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
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Checklist No.	**9**	**Persons Contacted**
Date of Audit	November 1, 2001	Jackie Adams, Substance Abuse Control Program Manager Christopher Childress, Associate HR Analyst, Substance Abuse Control Program
Auditors	Erik Juul Dennis Reed	
Department	**HUMAN RESOURCES**	

REFERENCE CRITERIA

1. CFR 49 Parts 653 & 654
2. CPUC GO 143-B Section 12.03 Use of Alcohol, Narcotics, or Drugs
3. VTA Substance Abuse Control Program: Drug & Alcohol Policy for Safety Sensitive Employees Under FTA Regulations, Revision #2, dated November 1998.

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

DRUG & ALCOHOL POLICY

For each rail transit employee who tested positive for drugs or alcohol in the period between November 5, 1998 to present and who is also currently employed in a safety sensitive position, review the appropriate records to determine whether or not:

1. The individual was evaluated and released to duty by a Substance Abuse Professional (SAP)
2. The individual was administered a return-to-duty test with verified negative results
3. Follow-up testing was performed as directed by the SAP according to the required follow-up testing frequencies of the reference criteria after the employee has returned to duty.
4. Consequences for repeat offenders were carried out as required by the D&A policy of VTA.
5. Random testing of safety sensitive employees is performed within the one-week period without excusing individuals for illegitimate reasons as required.

RESULTS/COMMENTS

The Auditors interviewed the Manager and the Analyst (Contacts) regarding the VTA Drug and Alcohol Program. The Manager reported that, effective August 1, 2001, CFR 49 Parts 653 & 654 have been eliminated and replaced by the new CFR 49 Part 655. The Manager reported that no Light Rail safety sensitive employees have tested positive after Part 655 became effective. Therefore, this checklist was audited to the standards of CFR 49 Parts 653 & 654.

The Auditors reviewed the records of safety sensitive employees who tested positive for drugs and/or alcohol. Six rail transit employees tested positive in the period from November 5, 1998 to October 31, 2001. The Auditors reviewed the action steps required by the reference criteria for each of these employees. In addition, the Auditors reviewed, in detail, the individual records for three employees.

1. The Auditors found that each employee was evaluated and released to duty by a Substance Abuse Professional (SAP).

2. The Auditors found that each employee was administered a return-to-duty test with verified negative results.
3. The Auditors found that, for each employee, follow-up testing was performed as directed by the SAP according to the required follow-up testing frequencies of the reference criteria after the employee has returned to duty.
4. The Contacts reported that they have established a written procedure on disciplinary consequences for repeat offenders. On the first occurrence, the employee receives an adverse record entry / written warning detailing the consequences of another positive test. On the second occurrence, the employee receives a 5 to 15 working day suspension based upon the employee's behavior and the SAP's opinion concerning the employee's potential for rehabilitation success. On the third occurrence, the employee will be subject to discharge, but if requested by the employee's superintendent, the employee's discharge may be mitigated by the VTA Substance Abuse Committee. If not discharged on the third occurrence, the employee will receive a 30 working day suspension and the employee, union, and VTA will sign a "Last Chance Agreement" which will include the employee's agreement not to misuse drugs and/or alcohol and automatic discharge for <u>any</u> positive test within five years. The Contacts provided a recent example of an employee who was discharged because of a positive test after a "Last Chance Agreement". The Auditors found that consequences for repeat offenders were carried out as required by the D&A policy of VTA.
5. The Contacts proactively track the random testing of safety sensitive employees to ensure the tests are performed within the one-week period. The Auditors reviewed the Contacts' Excused Drug and Alcohol Test Report. This report tracks trends, from 1999 to present, of excusing individuals from scheduled tests for illegitimate reasons. The Auditors found that the percentage of such illegitimate reasons has declined since 1999.

No deficiencies noted.

Recommendation:

None.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
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Checklist No.	**10**	**Persons Contacted**
Date of Audit	November 1, 2001	Raymond Frank, Chief of Security
Auditors	Erik Juul Dennis Reed	

Department	**PROTECTIVE SERVICES**	

REFERENCE CRITERIA

1. Light Rail Safety Program Plan (Security Portion) dated April 1999
2. RTSS-2 Procedure for Reviewing, Approving, and Filing Transit Agency System Safety Program Plans.

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

LIGHT RAIL SECURITY

Interview the Chief of Security of the Protective Services Unit, review the relevant Transit Crime Reports and the Security Breach Review Committee Meetings to determine whether or not:

1. Meetings were held on a regular basis to identify security breach causes, propose and recommend additions or changes to policies & procedures in order to prevent or minimize further security breaches of similar nature.
2. Security Plan modification process was followed as a result of changes to security needs and conditions of the transit agency.
3. Based on the above, determine whether or not the current Security Plan meets the elements of Item 24 in CPUC Checklist for reviewing System Safety Program Plans.

RESULTS/COMMENTS

The Chief of Security gave the Auditors an overview of the Protective Services Unit.

1. The Chief reported that he meets with his Director weekly on Security issues and that he meets with his senior staff every day. The Security Breach Review Committee meets regularly (approximately 2 to 3 times per month) although not a fixed schedule. Most meetings are dedicated to a specific issue. The Auditors reviewed records of issues that were addressed by the Committee. These records were found to be satisfactory.

2. The Chief reported that security plan modifications are submitted and approved by the Rail System Safety Review Board (RSSRB).

3. The Auditors reviewed records that documented that the Security Plan meets the elements of Item 24:
    a. The security role of each employee is defined through new employee orientations and regular staff meetings.
    b. System security goals and objectives are described in Section 1.3 of Security Plan
    c. Milestones for developing and implementing system security are established based upon the existing rail system, new extensions, acquisition of new light rail vehicles, increases in the number of passengers, and as a reflection of the community.
    d. Hazard Analysis guidelines and procedures have been established and implemented for various security issues including new extensions, closed circuit televisions, community awareness, and anthrax.

No deficiencies noted.

Recommendation:

None.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

Checklist No.	**11**	**Persons Contacted**
Date of Audit	October 31, 2001	
Auditors	Erik Juul Dennis Reed	Chester Patton, Transportation Superintendent, Light Rail Operations and Communication
Department	**Light Rail Operations and Communication**	Abrar Ahmad, Transportation Supervisor, Fire Life Safety Coordinator Light Rail Operations and Communication

REFERENCE CRITERIA

1. VTA Fire / Life Safety Program Plan
2. Light Rail System Safety Program Plan, November 2000, Element 14 – Emergency Response Planning, Coordination, Training

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

EMERGENCY RESPONSE

Through an interview with the manager-in-charge of the program and record review determine whether or not:

1. Emergency drills that included tabletop and practical exercises were planned and carried out with the participation of the appropriate external agencies (local, state, and federal agencies).
2. Training was provided to all emergency service agencies that included simulated emergency drills.
3. All drills were evaluated and critiqued in a timely manner.

RESULTS/COMMENTS

The Auditors interviewed the Transportation Superintendent and the Transportation Supervisor (Contacts) regarding the VTA Emergency Response Program.

1. In 2001, VTA conducted one tabletop exercise and two field practical exercises.

a. On April 6, 2001, VTA conducted a tabletop exercise simulating a light rail vehicle collision with a pedestrian resulting in severe injuries to the pedestrian. The Auditors reviewed the records, including the prepared agenda, scenario, minutes, and attendance lists.

b. On April 21, 2001, VTA conducted a field practical exercise, at Tasman and Alder, simulating a light rail vehicle collision with an automobile resulting in the derailment of the train. Milpitas Fire Department and Milpitas Police Department were active participants in the exercise. The Auditors reviewed the records, including the prepared agenda, scenario, minutes, attendance lists, and photographs. CPUC staff witnessed the exercise.

c. On April 26, 2001, VTA conducted a field practical exercise, at Tasman between Zanker and Morgridge, simulating a light rail vehicle collision with a pedestrian resulting in severe injuries to the pedestrian. This exercise was the field enactment of the April 6 tabletop exercise. San Jose Fire Department and San Jose Police Department were active participants in the exercise. The Auditors reviewed the records, including the prepared agenda, scenario, minutes, attendance lists, and photographs. CPUC staff witnessed the exercise.

2. The Auditors reviewed the Training Program for Emergency Personnel – Participant's Guide. The Auditors reviewed records that included emergency drill training for the appropriate emergency service agencies on aerial structures, in tunnels, and on-board the new low-floor Kinki Sharyo Light Rail Vehicles.

3. The Contacts reported and provided documentation that all drills were evaluated and critiqued in a timely manner. For each drill, the Contacts conducted an immediate on-scene post-drill critique with the emergency service agencies. Each drill was evaluated and critiqued at the next VTA Fire Life Safety Meeting.

No deficiencies found.

Recommendation:

None

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
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Checklist No.	**12**	**Persons Contacted**
Date of Audit	October 31, 2001	Curt Nicks, Way, Power & Signal Superintendent
Auditors	Erik Juul Dennis Reed	

Department	**RISK MANAGEMENT**	

REFERENCE CRITERIA

1. Light Rail System Safety Program Plan, dated November 2000-Element 20-Hazardous Materials Programs / Environmental Management
2. Bulletins #308-313
3. TRN-PR-### Hazardous Materials (Draft)

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

HAZARDOUS MATERIALS PROGRAMS/ENVIRONMENTAL MANAGEMENT

Interview the manager-in-charge and review relevant documentation to determine whether or not training that emphasizes safe handling of hazardous materials has been adequately provided as required by the reference criteria.

RESULTS/COMMENTS

The Auditors interviewed the appropriate VTA staff regarding training for the safe handling of hazardous materials. Element 20 of the Light Rail System Safety Program Plan states, in part, "Hazardous materials management are addressed through formal training programs that cover a variety of issues including confined space entry, respiratory protection, blood borne pathogens and technical instruction, which emphasizes safe handling of hazardous materials."

The Way, Power & Signal Superintendent reported that there is no training procedure for confined space entry. The Superintendent will hire outside consultants or contractors if there is a need to enter a confined space. If there is an emergency in a confined space, VTA will call the police and fire departments. [Note: Curtis Nicks wants to study this issue and discuss with CPUC staff.]

The Auditors reviewed the training procedures and records for respiratory protection. Certain employees, including workers in the paint and body shop and the upholstery shop, are required to complete a 2-hour class on respiratory protection. Certification and re-certification are required annually.

The Auditors reviewed the training procedures and records for blood borne pathogens. VTA car cleaners are required to complete a 2-hour class on blood borne pathogens. The employees are trained in the safe handling and disposal of needles, blood, and other bodily fluids. In addition, the employees attend regular tailgate meetings on these topics.

Recommendation:

1. Develop and implement a training procedure for confined space entry.

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Checklist No.	**13**	**Persons Contacted**
Date of Audit	11/01/01	Chester Patton, Transportation Superintendent
Auditors	Gary Rosenthal	John Carlson, Assistant Transportation Superintendent

Department	**RAIL OPERATIONS**	

REFERENCE CRITERIA

1. Light Rail System Safety Program Plan, dated November 2000-Element 22-Construction Contractor Operations
2. Light Rail Operations Restricted Area Access Procedures Manual, Revised 03/01/00 & 05/19/00
3. Light Rail Operating Rulebook Section 7 – Protection of Employees on Right of Way

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

RESTRICTED AREA ACCESS CONTROL

Interview the manager-in-charge and review relevant documentation to determine whether or not:

1. The required safety seminars on this subject are conducted and documented
2. Access permits are issued and distributed as required
3. Access permits are monitored to ensure adherence to the rules and procedures (including Lockout & Tag procedures).

RESULTS/COMMENTS

The auditor met with and interviewed the Transportation Superintendent, the Assistant Superintendent and two Transportation Supervisors. The topics discussed included:

- OCC authority concerning access to the right-of –way;
- System locations and conditions requiring access permits;
- Operation of the Light Rail Restricted Access Permit Office;
- Clearance from trains and energized lines;
- Safety training, safety equipment, hand signals and flagging;
- Contractor restricted access permit procedures;
- Reduced speed zone in ABS territory and the transit mall;
- Removal and restoration of traction power (lock-out & tag) procedures and;
- Right-of-way work area configuration.

The auditor reviewed the restricted access permit filing system, internal permit distribution process, weekly contractor and VTA Access Logs and the most recent six-month's restricted access permits. The auditor, accompanied by a VTA transportation supervisor, also made an unannounced inspection of contractor activities at a restricted access area in the VTA LRV storage yard.

The auditor met with and interviewed the Superintendent of Way, Power & Signal. Topics discussed

included:

- Weekly track allocation meetings;
- Way, Power & Signal employee restricted access training;
- Restricted access rules and procedures and;
- Roadway Worker training for VTA employees working adjacent to JPB tracks.

The auditor met with and interviewed the Technical Trainer Supervisor. Topics discussed included:

VTA restricted access training;

- Roadway worker training;
- Scope and content of both training programs and;
- Training files, scheduling and record keeping.

The auditor reviewed the restricted access training plans and annual summary training records for the year 2000. The auditor also reviewed roadway worker training plans and summary training records for the same period. The training folders of ten individual employees', required to be qualified to work on the VTA and JPB right-of-ways, were arbitrarily selected and reviewed.

The auditor found that the restricted access permits are issued and distributed as required by the Light Rail Operations Restricted Area Access Procedures Manual. The processes employed to review, approve, issue, distribute, and file the restricted access permits is particularly well organized and exceeds the requirements of the existing procedures.

The auditor found that Lock out & Tag Procedures are effectively controlled and documented by the Way, Power and Signals group. Each trained and qualified VTA employee or contractor working in a restricted access location is required to maintain a specific ally dated, numbered and very visible sticker on his or her hard hat. Any employee or contractor working on a restricted access area of the right of way without a hard hat or without the required sticker indicating that the employee is currently qualified and trained can be easily identified. VTA operating rules require that train operators and all other VTA employees report any non-qualified or improperly equipped persons, on restricted areas of the right-of-way, to the Operations Control Center.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

Checklist No.	**14**	**Persons Contacted**
Date of Audit	10/31/01	Curtis Nicks – Superintendent, Way Power & Signal Kyle Olson – Supervisor, Track
Auditors	Robert Strauss Brian Yu **Gary Rosenthal**	
Department	**WP&S**	

REFERENCE CRITERIA

1. CPUC GO 143-B Section 9.03-Installation of Fences, Section 9.12-Clearing Vegetation
2. MTN-PR-6404-Right -of -Way Maintenance, Issued 9/15/00
3. MTN-PR-6419-Right -of -Way Maintenance, Dated 03/23/01

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

RIGHT-OF-WAY MAINTENANCE

Through a round trip train ride, visually inspect the right-of-way by end of train observation to determine whether or not:

1. Trees or shrubbery within the right-of-way do not obstruct the vision of train operators.
2. Fences are such that they offer an adequate degree of security to the right-of-way from any possible intrusions.

RESULTS/COMMENTS

The auditors met and discussed VTA right-of-way vegetation control procedures and practices with the VTA contacts. The auditors also reviewed and discussed right-of-way fencing maintenance and repair procedures and practices with the same VTA representatives. Auditors reviewed all weekly "Way Power & Signal Reports" from 3/12/01 through 11/04/01. The review focused on vegetation control and fence repair and maintenance activities scheduled and performed during the period covered by those reports.

Auditors inspected the right-of-way, by train, between Bay Pointe Station and Santa Teresa Station on the Guadalupe Line. The inspection included checking for obstruction of train operator's view of signs, signals, pedestrians and motor vehicles by the growth of trees and shrubs along the right-of-way. The inspection also included checking the condition of security fences that prevent or discourage unauthorized entry of persons into the right-of-way.

The auditors found that the numerous trees and shrubs, along right-of-way had been effectively trimmed to allow train operators an adequate view of all signs and signals as well as pedestrians and motor vehicles at grade crossings. The auditors also found that all security fences, visible from the train, along the right-of-way were in good repair to prevent or discourage entry into the right-of-way by unauthorized persons.

Recommendation:

None

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

Checklist No.	**15**	**Persons Contacted**
Date of Audit	10/30/01	Austin Jenkins – Mgr. Rail Operations Planning & Activation
Auditors	Gary Rosenthal	
Department	**RAIL OPERATIONS**	

REFERENCE CRITERIA

1. Light Rail System Safety Program Plan, dated November 2000-Element-12-Rules & Procedures Review
2. Light Rail Operating Division Bulletin #1

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

RULES AND PROCEDURES REVIEW

Interview the manager in charge and review relevant documentation to determine whether or not:

1. All governing documents (Bulletins, Rules, and Standard Operating Procedures) are reviewed and updated annually by the Rules and Procedures Development Committee (RPD).
2. The rules & procedures that govern operational conduct on new, non-commissioned light rail extensions are developed and implemented.

RESULTS/COMMENTS

The auditor interviewed the Manager of Rail Operations Planning & Activation. Topics discussed included:

- SSPP reference to the rules and procedures review program requirement;
- VTA engineering representation on the Rules and Procedures Development Committee;
- The rules and procedures annual review schedule;
- Authority for interpretation of rules and procedures;
- Comprehensive distribution of modified rules and procedures;
- Scope of authority for Superintendent's Notices
- Rules and procedures review and change control management and;

The Rulebook for Conducting Test Operations.

The auditor also reviewed records of the Rules and Procedures Development Committee (RPD) activities for the first ten months of 2001.

The auditor found that RPD is responsible for the annual review of all VTA light rail rules and procedures. All 109 Light Rail Standard Operating Procedures (SOP) had been reviewed by the RPD in 2001. All current SOPs had been reformatted to the current VTA standard. Thirty-two SOPs were revised by RPD; reviewed and approved by the VTA Rail System Safety Review Board (RSSRB) and were distributed to VTA SOP manual holders.

During 2001, the Light Rail Operating Rule Book and Historic Streetcar Rules and Procedures as well as the Light Rail Operations Rulebook for Conducting Test Operations were revised by Rail

Operations Planning & Activation; reviewed and approved by RPD and RSSRB and issued for use over the signatures of the RSSRB Chairperson and the Director of Operations.

Recommendation:

None

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

Checklist No.	**16**	**Persons Contacted**
Date of Audit	11/02 /01	Garry Stanislaw, Technical Training Supervisor Michael Avery, Technical Training Supervisor Denise Daly, Manager, Training and Organizational Development
Auditors	Gary Rosenthal	
Department	**RAIL OPERATIONS**	

REFERENCE CRITERIA

1. Light Rail System Safety Program Plan, November 2000, Element #13 – Training & Certification, Element # 19 – Employee Safety Program
2. SOP #1.5, Operator Certification dated 1/1/95
3. SOP #1.9, Light Rail Operator Retraining/Refresher , Revised 4/18/01
4. SOP #1.10 Operator Evaluation/Ride Check ,Revised 4/2/01
5. CPUC General Order 143-B, Sections 12.02, 13.03, 13.04, 14.03, Effective 1/20/00

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

RETRAINING & RE-CERTIFICATION OF LIGHT RAIL EMPLOYEES

Select a random sample of employees (at least one from each employee classification see page 8 of SSPP) who are authorized to operate rail-borne mobile equipment in order to determine whether or not:

1. Retraining as well as refresher training is conducted per the applicable agency procedures and corresponding criteria.
2. Records are maintained per VTA records retention schedule.
3. On-board operational evaluations are performed per the applicable agency procedures. Violations are appropriately documented and for repeat offenses an “Operator Observation” Forms are issued.

Additionally, conduct field observations to evaluate adherence of train operators to rules and procedures.

RESULTS/COMMENTS

The auditor interviewed the Technical Training Supervisors. Topic discussed included:

- Retraining and refresher training as well as certification and re-certification;
- SOP #1.5, Operator Certification ;
- SOP #1.9, Light Rail Operator Retraining/Refresher Training;
- SOP #1.10 Operator Evaluation/Ride Check;
- Maintenance and retention of operations training records;
- Performance of on-board operations evaluations;
- On-board operator evaluations/ride checks
- Maintenance and retention of operator evaluations/ride checks files.

The auditor reviewed year 2000 summary retraining/refresher training records for all train operators and transportation supervisors. The train operator summary training record for the new Kinkisharyo

LRV was also reviewed. The auditor also reviewed the complete training folders for eight train operators and supervisors. The auditor reviewed the summary records for all year 2000 and 2001 on-board operational evaluations of train operators. Records of individual on-board operational evaluations for the same train operators reviewed for training were also checked.

The auditor conducted field observations aboard four trains to evaluate train operator's performance according to VTA rules and procedures. The on-board observations were performed between Gish Station and Bay Pointe Station and between Bay Pointe Station and Mountain View Station. Included in the rules and procedures compliance observations were: Speed through stations; reduced speed/slow zones; speed control through crossovers; use of bell and horn at grade crossings, approaching stations and passing through stations; Coasting through intersections and; passenger door operation. The on-board observations were performed during early evening hours and were surreptitious.

The auditor found that there is currently a roster of 111 train operators and 38 transportation supervisors requiring training, re-training and certification in the Guadalupe Division. According to records reviewed, all required retraining/refresher training and certification is, except for employees on long-term leave and not operating trains, current for the year 2001. The records also showed that VTA performed all required training and certification for all operators and supervisors in year 2000 as well. Kinkisharyo LRV training has been completed for 52% of train operators and supervisors. All train operators and supervisors should be trained before those vehicles are placed in revenue service.

The eight complete training folders reviewed contained all training records for each employee from the dates that each entered service in the Guadalupe Division. All folders had records exceeding the minimum four years required by GO 143-B except for employees who had been in the Division for less than that length of time.

The auditor found that the summary files for on-board operations evaluations showed that all train operators were evaluated at least twice during year 2000 and at least twice during 2001 as required by the VTA program. The only exceptions were train operators who were off work on long-term leaves and not operating trains.

The auditor did not observe any instance of failure to comply with any of the safety related rules and procedures during the on-board train operator observations. Though not directly related to a safety concern, one train operator's stations announcements were spoken so quickly that they were unintelligible to the auditor.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

Checklist No.	**17**	**Persons Contacted**
Date of Audit	10/31 /01	Chester Patton, Transportation Superintendent John Carlson, Assistant Transportation Superintendent Laura Jimenez, Transportation Supervisor Sally Massen, Transportation Supervisor
Auditors	Robert Strauss Brian Yu **Gary Rosenthal**	
Department	**RAIL OPERATIONS**	

REFERENCE CRITERIA

1. Light Rail System Safety Program Plan, dated November 2000 – Element 16 – System Data Acquisition/Analysis
2. VTA Superintendent's Notice January 6, 1999 (OCC Record Keeping)

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

UNUSUAL OCCRRENCES

Review appropriate documentation prepared during the last 2 years to determine whether or not:

1. Distribution list of reports are updated and maintained in a current status
2. Copies of the reports were distributed to all departments affected
3. Action was taken to mitigate safety-related incidents from occurring on the system

RESULTS/COMMENTS

The auditors interviewed the Transportation Superintendent of Light Rail Operations and Communications and three light rail Transportation Supervisors. The topics discussed included:

- Distribution lists used to distribute the daily unusual occurrence reports (UOR);
- Responsibility for maintaining the distributions lists;
- Distribution of the UORs;
- SOP # 1.3 - Operator Reports to O.C.C. and VTA Superintendent's Notice - January 6, 1999;
- Investigation and analysis of UORs and;
- Identification and implementation of corrective actions

The auditors also spent about two hours reviewing arbitrarily selected daily UOR forms in VTA files dating from January 1, 1999 through September 30, 2000.

The auditors found that distribution lists are comprehensive ensuring that the daily UORs are distributed electronically, both promptly and to a broad spectrum of departments and persons within the transit agency. The responsibility for maintaining the distribution list rests with a specified supervisor position and the distribution list is current.

The auditors found that directives establishing tasks and responsibilities for train operators and OCC supervisors regarding the reporting of unusual occurrences are clear, comprehensive and current.

Auditors found that the Transportation Superintendent maintains an electronic log of all UORs and investigates those that apply to or involve train operators and O.C.C activities. Those involving a performance failure(s) or a hazardous condition are analyzed and appropriate corrective actions are identified and implemented. The Superintendent, using the log, tracks the process.

This element of the safety audit did not investigate or evaluate how other Guadalupe Division units, Risk Management or other VTA departments use this important source of safety related information to identify and properly address hazardous conditions.

Recommendation:

None

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

Checklist No.	**18**	**Persons Contacted**
Date of Audit	11/1/01	Curtis Nicks – Superintendent, Way Power & Signal Billy Roberts – Supervisor, Power
Auditors	Joey E. Bigornia Brian Yu	
Department	**Way, Power, & Signal**	

REFERENCE CRITERIA

1. Light Rail System Safety Program Plan, November 2000, Element #11 – Maintenance Audits/inspection
2. SOP #6150, OCS Preventive Maintenance Program dated 5/11/01
3. CPUC General Order 143-B, Section 14.06, Effective 1/20/00

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

OVERHEAD CONTACT SYSTEM

Review the records of completed Overhead Contact System (OCS) inspections prepared during the last three years to determine whether or not:

1. OCS was inspected and adjusted at the required frequencies as specified in the reference criteria
2. Inspections were properly documented
3. Noted defects were corrected in a timely manner

RESULTS/COMMENTS

VTA's Overheard Contact System Inspections are performed on a monthly, semiannual & annual frequency interval. A summary scope of the overhead contact system inspection includes the following:

- Visual inspection of the concrete foundations
- Looseness of anchor bolts,
- Damage to bonding cables
- Warning signs & pole number plates installed
- Corrosion on protection guards
- Damaged or soiled porcelain insulators and cable terminals
- Contact wire support - position of insulators, correct fixing of contact wire clips, broken wires and touching of wires
- Tension wheel arrangement – corrosion of steel wire, free movement of tension wheel, etc.
- Pole switches – condition of switch, operating mechanism & connection
- Condition of all grounds and wearing of section insulators

VTA's Overhead Contact System (OCS) Maintenance Program inspection procedure was developed in May 2001 and inspections were implemented in August 2001. Staff's review of records was limited to 3-months of inspection records that were available in the files. Reviewed the monthly OCS inspection records dated August 2001 to October 2001 for the Mall location and the Northline locations. The required inspections were properly documented and noted defects were corrected in a timely manner.

Staff explained that **CPUC General Order No 143-B, Section 14.06 Traction Power System Inspection and Records** *requires that inspection records shall be kept on-file for four (4) prior calendar years* although staff determined that only 3 months of inspections records was available for review. Mr. Curt Nicks, Superintendent of Way, Power, & Signal, explained that a Standard Operating Procedure for OCS inspections did not exist prior to his acceptance of the Superintendent position in January 2001. Mr. Nicks attributes the absence of an established Standard Operating Procedure for OCS due to VTA's vacancy of Way, Power, & Signal inspector positions and lack of technical staff available to develop VTA's guidelines for the OCS Procedure. Since January 2001, Mr. Nicks has identified deficiencies that needed to be corrected in the Way, Power, & Signal Department and VTA currently has a master schedule that identifies the locations, frequency intervals of inspection, and tentative dates for completion of the required OCS inspections.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY		
Checklist No.	**19**	**Persons Contacted**
Date of Audit	11/1/01	Curtis Nicks – Superintendent, Way Power & Signal
Auditors	Joey E. Bigornia Brian Yu	

Department	**Way, Power, & Signal**	

REFERENCE CRITERIA

1. Light Rail System Safety Program Plan, November 2000, Element #11 – Maintenance Audits/inspection
2. SOP #6151, Substation Preventive Maintenance Program dated 4/30/01
3. CPUC General Order 143-B, Section 14.06, Effective 1/20/00

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

SUBSTATION INSPECTION

Review the records of completed substation inspections prepared during the last three years to determine whether or not:

4. Each substation was inspected at the required frequencies as specified in the reference criteria
5. Inspections were properly documented
6. Noted defects were corrected in a timely manner

RESULTS/COMMENTS

VTA's Substation Inspections was performed on a Weekly Inspection frequency interval since January 2001. On April 30, 2001, the Substation Preventive Maintenance Program was expanded to include additional inspection frequency intervals of quarterly, semi-annual, and annual checks of specific components within the substation. Staff explained that **CPUC General Order No 143-B, Section 14.06 Traction Power System Inspection and Records** *requires that inspection records shall be kept on-file for four (4) prior calendar years* although staff determined that only 3 months of inspections records was available for review. Mr. Billy Roberts, Power Supervisor, explained that the implementation of the revised Procedure occurred in August 2001 in conjunction with the Overhead Catenary System Preventative Maintenance Program Inspections **(See Checklist No. 18).** Therefore, availability of quarterly, semi-annual, and annual inspection records for review was limited to inspection records dated August 2001 – November 2001. The Way, Power, & Signal Department currently has a master schedule that identifies the locations, frequency intervals of inspection, and tentative dates for completion of the required substation inspections.

A summary scope of the substation inspections include the following:

- Verification of all alarms properly functioning with Operations Control Center
- Testing of emergency lights
- Check of battery charger and batteries
- Check of terminal connections (AC, DC, Neutral, & Positive cubicles)
- Check of diode fuses and closing of AC/DC main feeder breakers
- Conduct bypass control tests
- Conduct emergency shut down button tests
- Voltage measurements of the protective relays

Reviewed the Gish Substation Inspection records and Snell Substation Inspection records dated January 2001 to November 2001. The results of the review yielded:

Weekly:
The Weekly Inspection reports for the Gish substation and the Snell Substation were properly documented and noted defects corrected in a timely manner.

Quarterly:
The Quarterly Inspection of Gish Substation was performed on 10-31-01. The inspection was properly documented and noted defects corrected in a timely manner.

The Quarterly Inspection report of Snell Substation was unavailable for review since the quarterly inspection was not yet performed on 11/1/01 during the CPUC staff's review.

Semi-Annual:
Records unavailable for review since implementation of revised VTA Procedure.

Annual:
The Annual Inspection of Gish Substation was performed on 11-1-01. The inspection was properly documented and noted defects corrected in a timely manner.

The Annual Inspection report of Snell Substation was unavailable for review since the annual

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

Checklist No.	**20**	**Persons Contacted**
Date of Audit	10/29 /01	Curtis Nicks – Superintendent, Way Power & Signal George Ramos – Signal Supervisor Tom Ryan – Signal Maintainer
Auditors	Joey Bigornia Brian Yu	
Department	**Way, Power, and Signal**	

REFERENCE CRITERIA

1. Light Rail System Safety Program Plan, November 2000, Element #11 – Maintenance Audits/inspection
2. SOP #6205, Crossing Gate Preventive Maintenance dated 4/30/01

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

GATED GRADE CROSSINGS

Review the records of completed gated grade crossing inspections prepared during the last three years to determine whether or not:

7. Each gated grade crossing was inspected at the required frequencies as specified in the reference criteria
8. Inspections were properly documented
9. Noted defects were corrected in a timely manner

RESULTS/COMMENTS

Reviewed the Gated Grade Crossing Monthly Inspection Records for the Middlefield and Lockheed West grade crossings dated January 2000-October 2001. These two crossings are part of the Tasman Light Rail Extension Project that commenced on January 2000. All monthly inspection records for these two crossings were properly documented and noted defects corrected in a timely manner.

The auditors then selected Blossom River and Winfield grade crossings and reviewed the records from October 1998-October 2001. These were also properly documented and noted defects were corrected in a timely manner.

No exceptions were noted.

Recommendation:

None.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

Checklist No.	**21**	**Persons Contacted**
Date of Audit	11/1/01	Curtis Nicks – Superintendent, Way Power & Signal
Auditors	Joey E. Bigornia	

Department	**WP&S**	

REFERENCE CRITERIA

1. Light Rail System Safety Program Plan, November 2000, Element #11 – Maintenance Audits/inspection
2. MTN-PR-6206, Biennial Vital Relay Testing dated 12/01/00

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

VITAL RELAYS

Review the records of completed vital relay inspections prepared during the last three years to determine whether or not:

1. Inspections were performed at the required frequencies as specified in the reference criteria
2. Inspections were properly documented
3. Noted defects were corrected in a timely manner.

Additionally, randomly select as many relays as possible and conduct a field inspection to determine whether or not the measured pick-up and drop-away voltages are within the acceptable limits as specified in the reference criteria.

RESULTS/COMMENTS

Selected three vital relays from the Devine St. / 1st Switch #49 case (49TR, 49TPR, & 49NWPR), three from the Auzerais St. / Woz Way Case #26 (26ATPR, 26HR, & 26ATR) and three from the Tamien Station Case #37 (37ATR, 37ATPR, & 37HR) locations. Inspection Records dated 1998 – 2001 for the selected relays were reviewed. All inspections were performed at the required biennial frequency, properly documented, and noted defects were corrected in a timely manner. No exceptions were noted.

Recommendation:

None.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

Checklist No.	**22**	**Persons Contacted**
Date of Audit	10/30/01	Tom Kennedy – Superintendent, Vehicle Maintenance
Auditors	Joey E. Bigornia Brian Yu	
Department	**Vehicle Maintenance**	

REFERENCE CRITERIA

1. Light Rail System Safety Program Plan, November 2000, Element #11 – Maintenance Audits/inspection
2. MTN-PR-5150 Light Rail Vehicle Daily Inspection Procedure, Issued 11/01/98
3. MTN-PR-5158 Light Rail Maintenance Work Orders, Issued 07/01/98
4. MTN-PR-5159 Light Rail Vehicle Placement and Status Report, Issued 06/01/98

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

LRV MAINTENANCE

Randomly select 3 vehicles and review all the appropriate records prepared between January 1999-present to determine whether or not:

1. Inspections were performed per the required frequencies and documented properly
2. All Work Orders were closed out in a timely manner

RESULTS/COMMENTS

Selected three VTA light rail vehicles (#809, #828 & #849) and reviewed maintenance records of the daily inspection (January 2001 – October 2001), minor inspections, and major inspections required for the time frame of September 1999 – October 2001.

The **daily inspection** is performed on light rail vehicles (LRV's) returning to the yard at the end of revenue service. The inspection consists of a walk through of the car interior looking for any loose, defective, or missing car parts, replacement of interior or exterior light bulbs, replenishment of fluids, etc. The undercarriage is visually inspected for loose or damaged car parts and the sander & sandbox level associated with the emergency brake system is checked for proper operation. All safety related lighting, door systems, and passenger compartment equipment is checked for proper operation.

The **minor inspection** is performed every 10,000 miles where the LRV undercar, exterior, and interior components are inspected and lubricated. The undercar check consists of traction motor brushes, replacement of gear box oil / level check, inspection of brake pads on the wheels, and verification of air compressor pressures for start up and shut down. The exterior check consists of pantograph carbon wear, coupler operations, shunting of the ground brush assembly, and general body condition of all glass, rubber seals, and skirts. The interior check consists of emergency door release, test of traction power interlock, passenger door mechanical connections, test of dash lights, switches, pantograph operation and general condition of train operator cab area. Additional interior checks of the air conditioning system, emergency lighting, stop request & interior lighting, and the emergency windows also occur.

The **major inspection** is performed every 30,000 miles where the LRV undercar, exterior, and interior components are inspected and lubricated as described in the **minor** inspection. The undercar check of the minor inspection is expanded to include a check of the transponder, wheel profile, motor/alternator motor brush condition for wear, lubrication of the brake calipers and a measurement of the brake rotors. The exterior check is expanded to include a check of the DC/DC converter and test voltages followed by a check of the battery breaker cut off operation. The interior check is expanded

The records indicate that the daily, minor and major inspections were performed at the required frequency intervals and documented properly. A review of the work orders files associated with each vehicle reviewed indicates that defects noted have been closed out. No exceptions noted.

Recommendation:

None.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE SANTA CLARA VALLEY TRANSPORTATION AUTHORITY		
Checklist No.	**23**	**Persons Contacted**

Date of Audit	11/2 /01	Curtis Nicks – Superintendent, Way Power & Signal George Ramos – Signal Supervisor
Auditors	Joey E. Bigornia	
Department	**WP&S**	

REFERENCE CRITERIA

1. Light Rail System Safety Program Plan, November 2000, Element 10 – Facility Inspections
2. MTN-PR-6201, Monthly Platform Preventive Maintenance, Issued 04/06/1999

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

LIGHT RAIL STATION SAFETY INSPECTIONS

Randomly select at least three light rail stations and review their maintenance records to determine whether or not:

4. Inspections were performed and documented as required
5. Noted defects were corrected and documented in a timely manner

RESULTS/COMMENTS

A summary scope of VTA's inspections includes the following:

- Lighting maintenance on the station
- Communications check of the public address system and the clarity of maintenance telephones
- Validation machine print for date & time
- Mobility impaired lift operation
- Ticket vending machine cleaning & functional check

Selected the Component Station, Whisman Station, and San Antonio North and reviewed inspection records dated September 2000 to October 2001. All inspections were performed and documented at the required frequencies (monthly, quarterly, and semi-annual) as required and noted defects were corrected in a timely manner. No exceptions were noted.

Recommendation:

None.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

Checklist No.	**24**	**Persons Contacted**
Date of Audit	10/29 /01	L. Cris Crisologo – Quality Assurance / Warranty Manager Brigido Sanchez – Quality Assurance / Warranty Specialist
Auditors	Joey E. Bigornia Brian Yu	
Department	**Quality Assurance**	
REFERENCE CRITERIA		

1. Light Rail System Safety Program Plan, November 2000, Element 11 – Maintenance Audits / Inspections
2. MTN-PR-7202, Precision Measuring Equipment (PME) Calibration Program, Dated 01/15/00
3. MTN-FR-7202A, Calibration Program Audit Checklist, Dated 01/15/00
4. MTN-FR-7202B, Calibration Program Random Inspection Checklist, Dated 01/15/00
5. MTN-FR-7202C, Calibration Supplier Audit Checklist, Dated 01/15/00

ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION

CALIBRATION PROGRAM

Interview the manager-in-charge of the calibration program and review appropriate documentation to determine whether or not:

1. All Precision Measuring Equipment (PME) that are used to maintain VTA equipment are properly maintained and calibrated according to the reference criteria
2. Random PME checks by QA foreperson or Supervisor are performed per the required frequencies and documented properly
3. Verify that current Certificates of Calibration are filed in the Calibration Binder

RESULTS/COMMENTS

1. QA Assurance / Warranty Manager Mr. L. Cris Crisologo explained to staff that the calibration program was implemented on January 2000. The initial calibration program specified a semi-annual calibration frequency interval of all precision measuring equipment (PME) used by the LRV Maintenance Department and the Way, Power, & Signal Department. A review of the PME records indicates that all equipment was tested on a semi-annual frequency interval for Year 2000.

QA Assurance / Warranty Manager Mr. L. Cris Crisologo also explained to staff that VTA's Quality Assurance Management evaluated the results of the Year 2000 **semi-annual** frequency interval calibration test records in accordance with Section 3.4.6 of VTA'S Procedure: Precision Measuring Equipment (PME) Calibration Program. VTA's QA Management determined that an **annual** frequency interval in 2001 for equipment subjected to calibration would be cost effective and sufficient for monitoring all PME's since year 2000 calibration test results did not show a high rate of failure for equipment. VTA's review of the manufacturer's manuals for all equipment used a both departments also indicates that an **annual** calibration interval frequency is sufficient.

Reviewed Calibration/ Service Certificates of one Dial Caliper (s/n BKK4), Multimeter (s/n 57710237), Oscilloscope (s/n 2205HK54092), Micrometer (NSK 0-6"), and Torque Wrench (s/n WVF38339) used at the Light Rail Vehicle Maintenance Department and one Multimeter (s/n 3130), Oscilloscope (s/n 206329) and Torque Wrench (s/n CDI 751DLIN) used at Way, Power, & Signal Department. The Calibration / Service Certificates filed in the Calibration Binder for each equipment selected for review showed that all equipment were calibrated twice/year in 2000 and are now being calibrated once/year for 2001. No exceptions were noted.

2. Reviewed QA's Calibration Program PME Random Inspection Checklists of the Light Rail Department and the Way, Power & Signals Department.

   Light Rail Department:
   The records indicate that a Random Inspection of the Light Rail Division occurred on June 18, 2001and deficiencies were noted on 4 of 6 checklist items reviewed. Subsequent records dated July 5, 2001, August 20, 2001 and September 4, 2001 show the corrective actions implemented for each deficiency noted by VTA. The September 4, 2001 Calibration Program PME Random Inspection indicate that all deficiencies have been closed. No exceptions noted.

   Way, Power, and Signal:
   The records indicate that a Random Inspection of the Light Rail Division occurred on October 15, 2001 and no deficiencies were noted on the 6 checklist items subject to review. No exceptions were noted.

Recommendation:

None.

CPUC SYSTEM SAFETY AUDIT CHECKLIST FOR THE
SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

Checklist No.	**25**	**Persons Contacted**
Date of Audit	11/1/01	Curtis Nicks – Superintendent, Way Power & Signal
Auditors	Joey E. Bigornia Brian Yu	
Department	**WP&S**	

REFERENCE CRITERIA
1. Light Rail System Safety Program Plan, dated November 2000 – Element 11 – Maintenance Audits / Inspections 2. MTN-PR-6805 dated 11/15/00 3. Procedure chosen at the time of the audit that provides guidelines to be followed during inspections of a WP&S system
ELEMENT/CHARACTERISTICS AND METHOD OF VERIFICATION
WAY POWER AND SIGNAL INTERNAL AUDIT PROGRAM Interview the manager-in-charge of the audit and review the WP&S Audit Forms as well as records of a preventive maintenance chosen at random which was performed during the last 9 months to determine whether or not : 1. The WP&S Internal Audit requirements were satisfied. 2. Preventive Maintenance procedure guidelines were followed.
RESULTS/COMMENTS

The purpose of this program is to ensure that a meaningful and effective preventive program is implemented at VTA. The program reviews the current procedures and frequency of inspections and the results of this program will be used as an input or feedback to the Way, Power, & Signal Department's Maintenance, Training & Safety Program.

Reviewed the Internal Rail Safety Audit Checklist & Findings of the Vehicle Maintenance Department and the Way, Power & Signal Department performed on April 30, 2001.

Vehicle Maintenance:

The Vehicle Maintenance internal audit consisted of a review of 12 months of records of the following: Daily Inspections, LRV Pull-in & Removal from Service, Blowdown Procedure, LRV Testing Procedure, Preventive Maintenance Inspection Scheduling, Work Orders and LRV Placement & Status Reports.
The results of the audit identified a recommendation that Retraining for all Daily Inspection Personnel on proper SAP input is required and the implementation schedule identifies the training would occur during the SAP4.6 upgrade on 5/22 – 5/25/01.

Way, Power & Signal:

The Way, Power & Signals internal audit consisted of a review of 12 months of records of the following types of inspections: substations, track maintenance, overhead, power, station maintenance, switches, and signals. The results of the audit identified that "…Improvement is needed in tracking defects noted during inspections and documenting repairs for substations, track maintenance, overhead preventive maintenance, and switch inspections." VTA's auditor suggests on the checklist the method for tracking defects is: writing work orders for preventive maintenance inspections, allow a space for a work order number identification to be included on the hard copy inspection form, create a work order for each defect observed, and all work orders will record the repairs of observed defects in terms of completing the cycle of Inspection, Observation, Notation, & Repair.

The corrective actions to the Internal Audits Program (IAP) of the Vehicle Maintenance and Way, Power & Signal Departments were shown to the auditor respectively however it could not be determined if a follow-up occurs by the IAP team to determine if the corrective actions have been implemented.

The CPUC Triennial audit of the overhead catenary system inspections (checklist #18), substation inspections (checklist #19), LRV maintenance inspections (checklist #22) supports the fact that defects found during inspections are being tracked by work orders.

Recommendation:

1. The Internal Audit Program staff should expand the current procedure to identify which department should have the responsibility of monitoring the implementation of corrective actions identified during preventive maintenance audits. See Checklist Nos. 18 & 19.